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Climate measurements as a part of multidisciplinary project at the James Ross Island, Antarctica

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In the northern part of the James Ross Island, atmospheric factors and local climate pattern are investigated as a part of complex project including geology, geomorphology, plant physiology and ecology. Since 2005, an integrated multidisciplinary study of structure and function of terrestrial ecosystems has been carried out close to the Czech Antarctic station J.G.Mendel (63˚48'S, 57˚53'W). The measurement of energy balance between the atmosphere and ground surface is in the center of our interest. Also the effect of microclimate on the recent deglaciation is studied. The first automatic weather station (here after AWS) was installed at the J.G.Mendel station in February 2004. Then, several other AWSs (EMS Brno, CZ) had been installed at typical terrestrial ecosystems within the period of 2005-2007. In this contribution, the first results of climate variability at the different sites of the James Ross Island are presented. In spite of high cloudiness (mean of 80–90 %), global solar radiation can reach the maxima as high as 30 $MJ.m^{-2}$ on clear sky days around summer solstice. Annual mean air temperature at the J.G.Mendel station is -5.4 ˚C. The warmest month is January with the monthly mean of 2.0 ˚C. The coldest month is August in which the monthly mean temperature is -13.4 ˚C. Minimal temperature may drop below -20 ˚C during episodic short-term events. Rapid interdiurnal changes of air temperature and relative humidity are caused mainly by cyclonic activity and fast movements of air masses along 50 and 60˚S latitudes.